STUDENT VOLUNTEER MOVEMENT SSIONS
125 EAST 27TH STREET, NEW YORK C Y.
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TROPICAL RESEARCH

In its Relation to the Missionary Enterprise,

Being an Address delivered at
LIVINGSTONE COLLEGE,
on Commemoration Day, June
29th, 1908,

BY

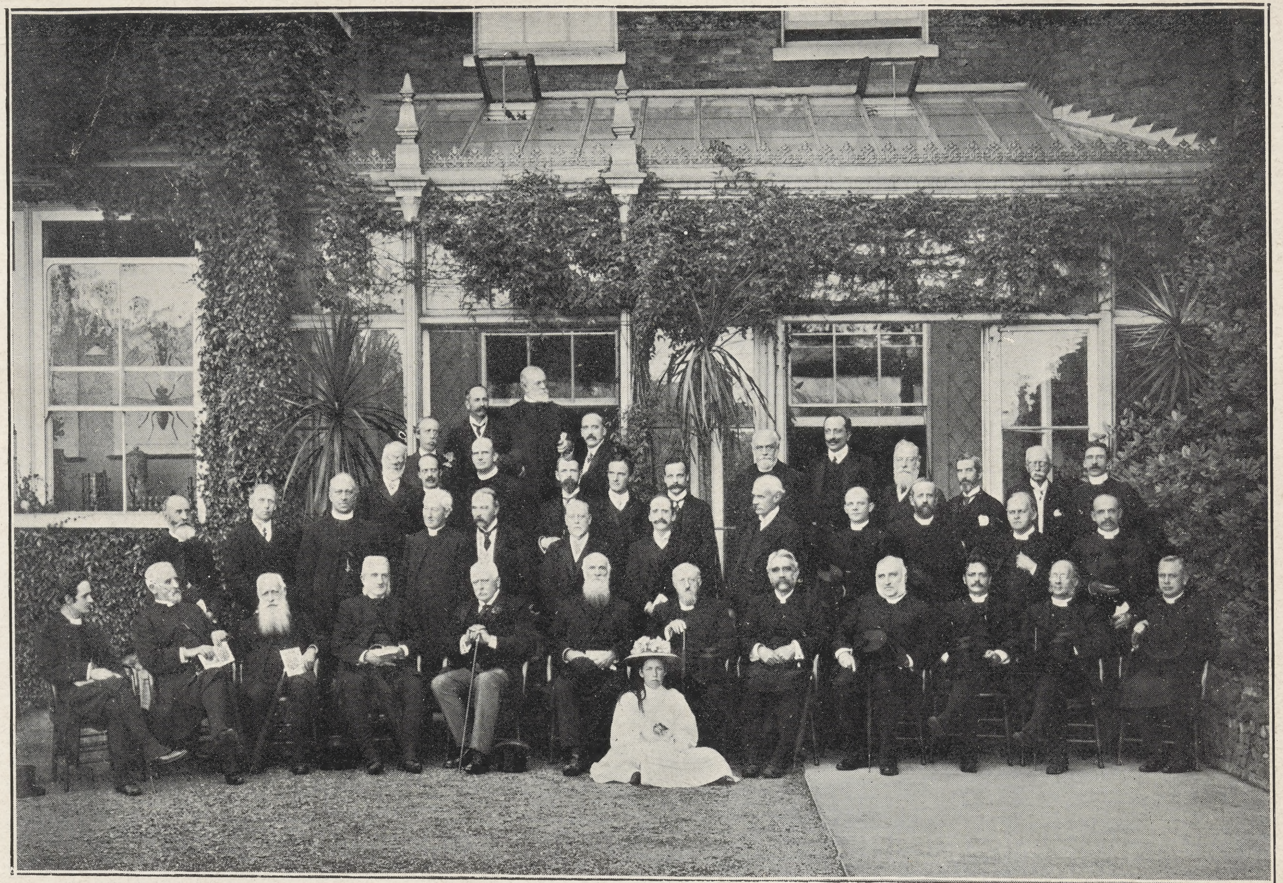
SIR PATRICK MANSON,

K.C.M.G., F.R.S., M.D., F.R.C.P., ETC.

LIVINGSTONE COLLEGE,
LEYTON, E.

1st Row—Dr. Wm. Wilson, (*F.F.M.A.*), Mr. Wm. McCall, Bp. of North Carolina, Mr. Willway.

2nd Row—Rev. Wm. Dale, D.D. (*Presb. Ch. of Eng.*), Rev. C. J. Klesel (*Moravian Missions*), Bp. of South Dakota, Dr. Harford (*Principal*), Mr. Compton (*Lecturer*), Mr. W. McAdam Eccles (*Deputy Principal*), Bp. of Barking, Dr. Castellani, Dr. Soltau, Mr. Christie Reid, Dr. McReddie, Rev. T. B. Johnson.



3rd Row—Rev. E. P. Cachemaile, Dr. G. Basil Price (*Vice-Principal*), Rev. W. E. Jackson (*S.P.G.*), Bp. of Grafton and Armidale, Mr. Eliot Howard, Rev. W. J. Mills (*B.M.S.*), Dr. Moorshead, (*B.M.S.*), Dr. Sandwith, Bp. of Hankow, Bp. of Mid-China, Bp. Ingham (*C.M.S.*), Bp. of Moosonee.

4th Row—Bishops of Gibraltar, Barbadoes, Waiapu, and Bendigo, Sir Patrick Manson, Bishops of Missouri, St. Albans, Uganda, Meath, W. Equat. Africa, and Kiu Shiu, Dean of Barbadoes.

Miss Eleanor Harford.

Livingstone College,

LEYTON, E.

A College for the
Instruction of Foreign
Missionaries in the
Elements of Medicine
and Surgery.

Programme and Notices

For Session 1908-9.

E,

SESSION 1908-9.

September 30th, 1908.

THE REGULAR SESSION OF NINE MONTHS COMMENCES, and this is the best time to enter for those who can take the full course.

Students may also enter for one or two terms. These are open to men only.

***November 30th, 1908.**

SPECIAL COURSE of Sixteen Lectures, on the Preservation of Health in Tropical Climates, commences. Open to men and women.

January 6th, 1909.

NEW TERM BEGINS. Students may enter for two terms or one term, or in exceptional cases, for three terms. These are open to men only.

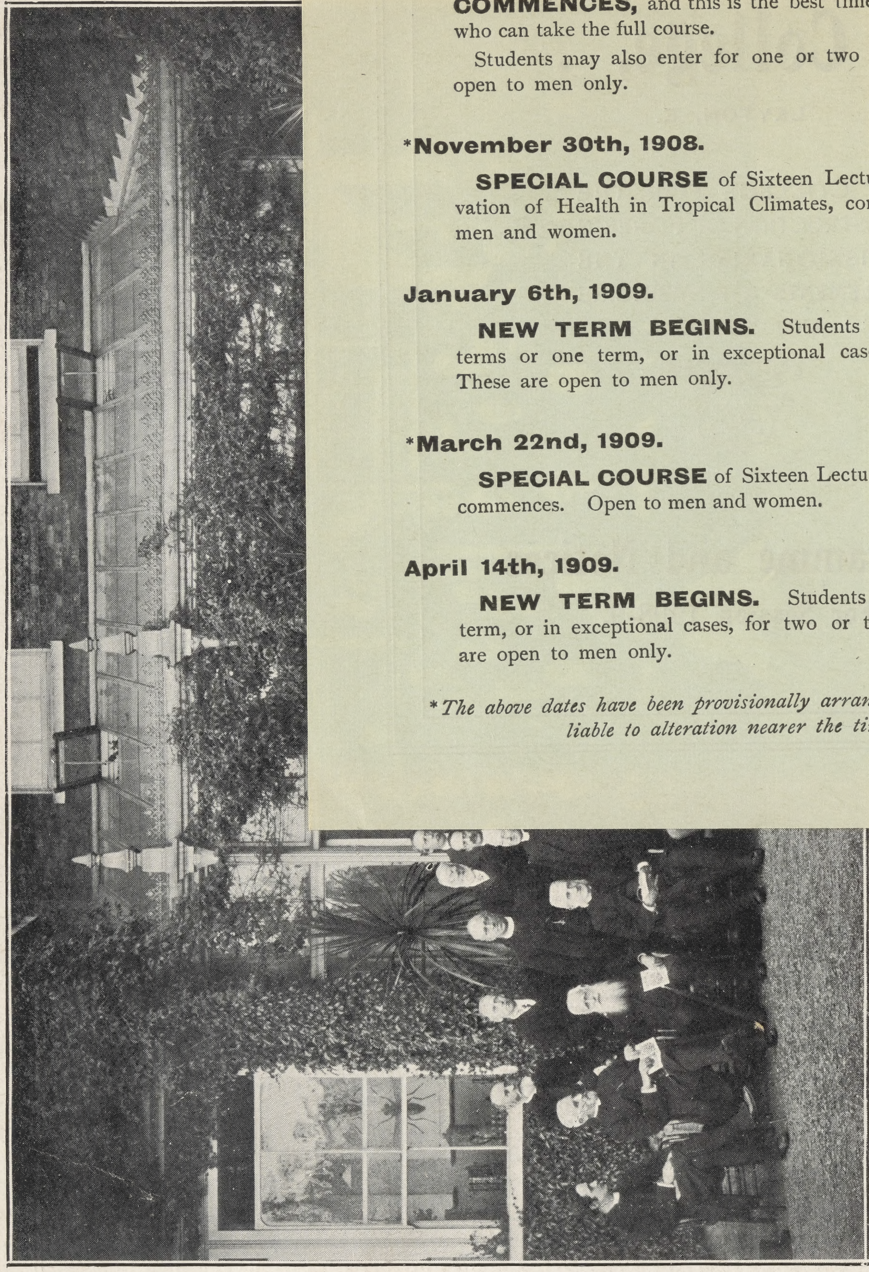
***March 22nd, 1909.**

SPECIAL COURSE of Sixteen Lectures, as in December, commences. Open to men and women.

April 14th, 1909.

NEW TERM BEGINS. Students may enter for one term, or in exceptional cases, for two or three terms. These are open to men only.

**The above dates have been provisionally arranged, and they are liable to alteration nearer the time.*



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4th Row—Bishops of Gibraltar, Barbadoes, Wal
W. E

AIMS AND OBJECTS.

It is intended to teach Missionaries:

(*a*) How to care for their own health and the health of their fellow Missionaries when far from qualified Medical aid.

(*b*) How to deal with the more simple diseases of the natives of the Country in which they will be working.

WHO SHOULD ENTER?

Missionary Candidates.

All men destined to work in lonely places should enter for the full session of nine months, others possibly for shorter periods. The longer courses are only open to men.

All men and women going to the Tropics should at least attend the short course of Lectures on Tropical Hygiene.

Missionaries on Furlough.

These will find the training of special value.

The Principal will gladly furnish evidence from letters from old Students which have been published demonstrating the value of the training either to Missionary candidates or returned Missionaries.

E,

PREFACE.

Sir Patrick Manson's address indicates in a graphic manner the remarkable progress which has been made within recent years in the department of Tropical Medicine, and shows the great difference between the chief Diseases which are met with in the Tropics and those which are found in this country. It is believed that the address will be of interest to a much larger circle than those who were privileged to hear it, and it has therefore been reproduced with illustrations of some of the chief parasites mentioned in the address. Nothing could more forcibly emphasise the great importance of the training given at Livingstone College than the statement which is here given, and it is hoped that readers of this pamphlet will help to make the College known to any to whom it may be of service.

This address was delivered on Commemoration Day at Livingstone College, on June 29th, 1908, the Proceedings on this occasion being of special interest, owing to the presence of representative Bishops who had attended the Pan-Anglican Congress. The Bishop of St. Albans, who presided, had kindly selected the day, and bore eloquent personal testimony to the value of the College. Bishop Molony, of Mid-China, a former student of the College, and Bishop Tugwell, of Western Equatorial Africa, also testified to the vital importance of medical training for Missionaries.

There will be found on the second page of Cover a group of the Bishops, together with other representatives attending the Commemoration Day Proceedings.

TROPICAL RESEARCH

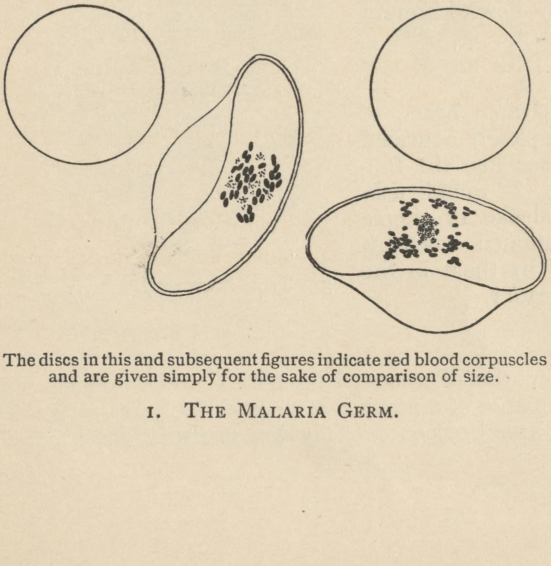
IN ITS

RELATION TO THE MISSIONARY ENTERPRISE,

BY

SIR PATRICK MANSON, K.C.M.G., F.R.S., M.D., F.R.C.P., Etc.

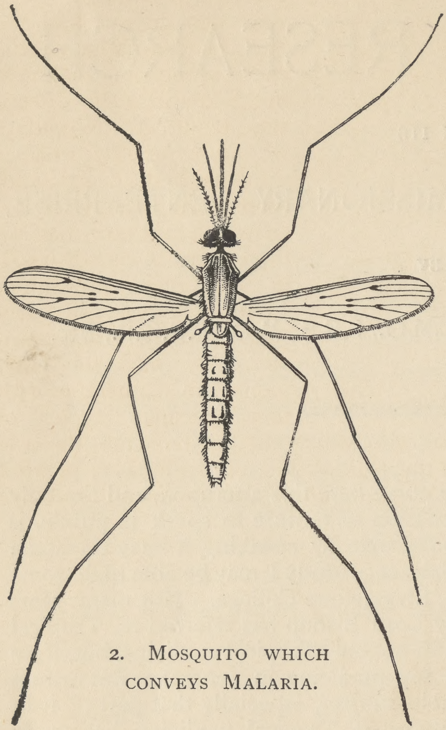
THE only thing that induced me to come here this afternoon, and the only thing that induces me on any occasion to venture to speak in public, is a sense of duty, and the possibility that by speaking I may do some good, and I am fully aware that if I speak successfully I may be able to do some good to this most deserving Institution, Livingstone College. Not many years ago, certainly since the period that my Lord Bishop has referred to, Tropical medicine was in a very backward way, and not only Tropical medicine, but, if we physicians would be honest, we must say medicine in general. But within the last twenty or thirty years, the whole subject, especially that part of it in which Missionaries are particularly interested, Tropical medicine, has made enormous progress. I think I do not overstate the case when I say that the Missionary educated in Livingstone College to-day is more capable of grappling with the problems of Tropical medicine than the fully educated physician of thirty years ago. It is within these few years that we have learned to recognise the germ cause of most Tropical diseases, and the ways in which these germs are transmitted from one person to another. We have also learned, in consequence of that knowledge, how to prevent the transmission and, in not a few instances, how to eradicate the germs themselves. Now all this knowledge has been attained with difficulty and after much study, but when the knowledge has been attained its application is by no means so difficult. Thirty years ago no man knew what Malaria was; no man had



The discs in this and subsequent figures indicate red blood corpuscles and are given simply for the sake of comparison of size.

1. THE MALARIA GERM.

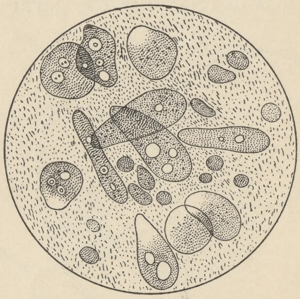
the slightest conception of how it was caused, how it was transmitted, nor what was the nature of the germ. All sorts of theories used to be expressed in connection with the subject—blue mists and things of that description hanging over low-lying countries were said to produce Malaria; emanations from mud banks and swamps were said also to produce this important and peculiar disease. Nowadays we know that Malaria is a minute animalcule that lives in the blood of man. Further we know that this animalcule is transmitted from one human being to another by means of mosquitoes; these biting an infected man become themselves infected and can thus infect someone else. These are indubitable facts, and enable anyone acquainted with them to prevent Malaria. Furthermore, if by a course of training such as students in this establishment can receive, the individual is taught how to recognise Malaria by its symptoms, it is in his power by the simple administration of quinine, to check the disease if not to eradicate the germ.



2. Mosquito which conveys Malaria.

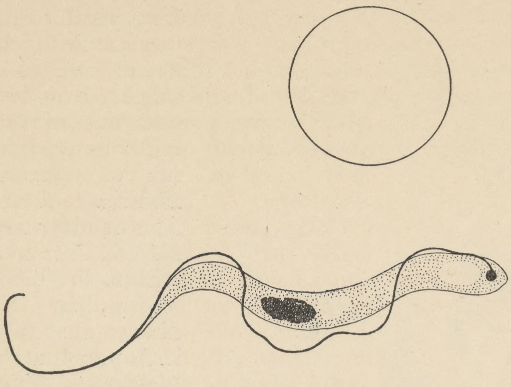
Something similar obtains with regard to many other Tropical diseases. Take that other great Tropical scourge, Dysentery. We know how this is caused, and we know with precision and certainty how to prevent and treat it.

What is the use, one often hears, of an inadequately and incompletely educated man trying to treat disease like the full-fledged physician? Why, I would ask, should not a partial knowledge of simple facts such as I have mentioned—such as men here receive--be used by them in the prevention of disease and death?

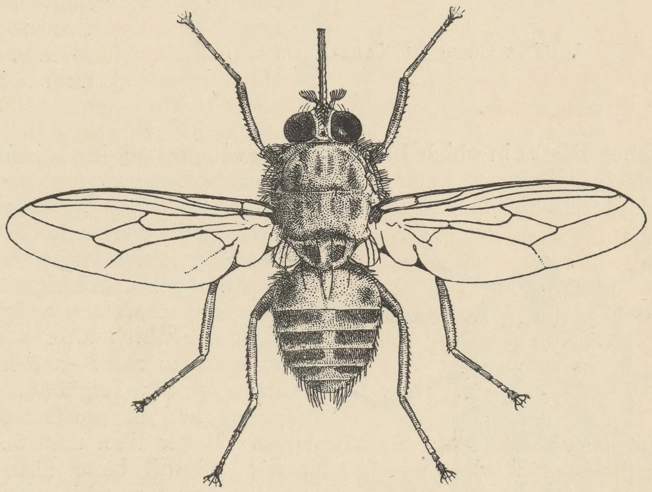


3. The Germ of Dysentery.

Before coming down here this afternoon, I thought I would refresh my memory by drawing up the names of a number of diseases the germ-causes of which, in the last few years, have been successfully demonstrated, but I found my paper would not hold them all. Let me enumerate some of them. Take Sleeping Sickness. Ten years ago no one had the slightest idea of what was the cause of Sleeping Sickness, much less how the disease was acquired. Nowadays we know exactly what is the cause of the disease and, more or less, exactly how it is acquired, and how, had we the means at our disposal, it can be prevented. Livingstone was an early pioneer in this subject—in fact, he was the first pioneer in connection with this peculiar type of disease. It was Livingstone, I believe, who was the first to recognise the true nature, or approximately to recognise the true nature, of fly-disease; or what is known as fly-disease in Africa. We now know that fly-disease in Africa attacks not beasts only, as Livingstone saw, but man also. We know that the same fly, or similar flies are equally dangerous to man and animals, although the exact species of fly which transmit their respective germs may be different. Pity it is that the simple, direct mind of Livingstone was not backed up by the appliances of modern science.



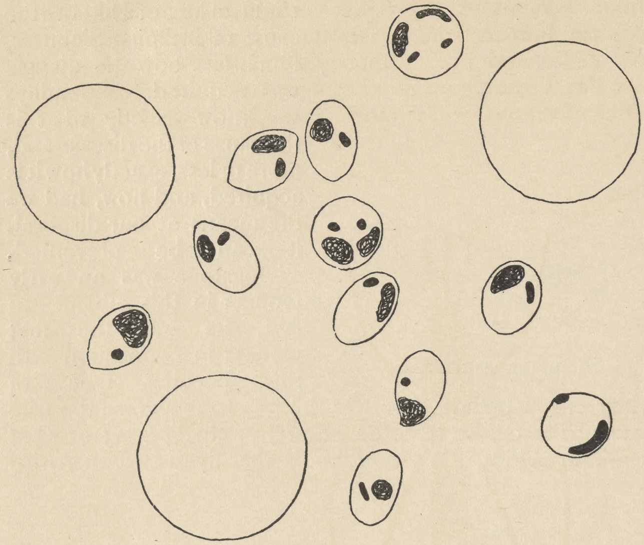
4. The Germ of Sleeping Sickness.



5. A Tsetse Fly.

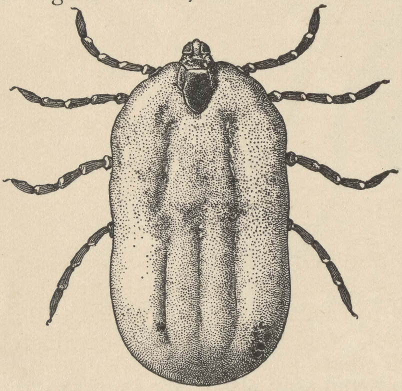
Another disease recently discovered is known by the peculiar name of

Kala-Azar—black sickness. Five years ago that disease was supposed to be a form of Malaria. Everybody regarded the man with the big spleen, the big liver and emaciated limbs as the victim of Chronic Malaria. Nowadays we know that Malaria has nothing to do with the disease, that it is a disease absolutely independent of Malaria. Efforts are being made to determine in what way this disease is transmitted. The idea has got abroad, and very likely it is correct, that it too is carried to man by some kind of insect.



6. The Germ of Kala-Azar.

Another disease in which Livingstone was interested—and, indeed, a disease to which Livingstone, as far as the English-speaking race is concerned, was, as regards Africa, the first to call attention—is the Relapsing Fever of that country. This disease has been recognised with precision only within the last three or four years. We know now that a peculiar fever, characterised by very high temperature, which after a time subsides, again to recur—and in this way recurring, perhaps, eight or ten or more times—is not an unusual disease in Africa. Better than that, we know its cause; and still better than that, we know the way in which the cause is acquired. We now know that a form of tick, common in the hovels of African natives, is the transmitting agent of the germ of the disease. With that knowledge we know how to escape the disease. Avoid the infected huts where the ticks reside, and you will not get Relapsing Fever of Africa.



7. An African Tick.

A very important disease in some parts of the world, though fortunately only in a limited part of Africa, is Yellow Fever. Now, we know that Yellow

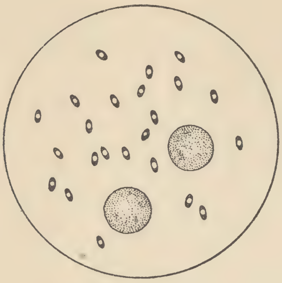
Fever is due to a minute ultra-microscopic germ residing in the blood or the infected individual, present there in active form for three days only—so minute that it will pass through a filter; so minute that the highest powers of the microscope cannot recognise it. Yet this germ is an organised entity, and is transmitted from one human being to another by a kind of mosquito. Get a man with Yellow Fever, and place a mosquito on his body. Keeping that mosquito for twelve days, place it on another man, and in three days' time that man, bitten by this mosquito, will almost certainly show evidences of Yellow Fever. This knowledge has been acquired within the last few years. Thanks to this piece of knowledge, the West Indies are now practically rid of one of their worst diseases. Without this particular piece of knowledge the Panama Canal, as a great engineering feat, would have been exceedingly costly both in money and lives. With that piece of knowledge the responsible Director of the Health Department in Panama is able to report month by month that the Panama Canal route is now more healthy than New York.

8. Mosquito which conveys Yellow Fever.

Another Tropical disease of less importance—but still to those who have been the victims of it a very interesting disease—is Dengue, and, although we have not found its germ, it, likewise, is probably mosquito-conveyed.

Given a patient with Dengue, or with Yellow Fever, and you may inhabit the same room with him, without risk of infection, if adequately protected from mosquitoes.

Plague has been the bugbear of the half-civilised communities of the world since history began. Its germ can now be put on the point of a needle, and demonstrated with the microscope with absolute certainty. We also know under what circumstances Plague is acquired. The rat is the principal transmitting agent. It is very susceptible to Plague, and often dies from Plague. When the rat dies, the parasite which lives on the rat, the rat-flea, leaves, like a sensible animal, the cold dead rat, from which it can no longer obtain nutriment, and passes to the warm living man, and so infects him.



9. The Germ of Plague.

10. The Common Flea.

Within the last eighteen months there have been important discoveries made in connection with the disease known as Malta Fever, a disease of great economic importance to the British Empire, inasmuch as it used to ravage the troops that Britain is obliged to station in her Mediterranean fortresses. The way in which the germ-cause of Malta Fever was acquired was quite unknown till recently. Now we know this cause : its peculiar germ is transmitted in infected milk. The goats of Malta, apparently in perfect health, are the subjects of this infection, and in their milk they excrete the germ which produces the disease. Anyone drinking milk so infected, after a little time, is liable to show the symptoms of Malta Fever. Malta Fever is sometimes of a very serious character, leading to death, and always producing a vast amount of invaliding. Boil the goats' milk, or, better still, do not keep goats. By attending to this simple indication the British taxpayers' pocket has been saved a lot of money, and the health and comfort of our garrisons in Malta and Gibraltar have been enormously enhanced.

Only to-day I have received a letter from a friend abroad who is interested in another important Tropical disease called Beri-beri—of very great importance in Tropical countries. That letter, which is from a particularly careful observer, states that he thinks that the way in which this disease is acquired has at last been demonstrated. If that be so, then another Tropical disease can be dealt with. I am not at liberty to disclose the facts, but I think I am at liberty to mention my correspondent's conclusions.

11. The Germ of Cholera.

One of the great scourges of India, and also from time to time of Europe, but which has not so far reached West or Central Africa, is Cholera. The germ of Cholera is known—it can easily be demonstrated. It is transmitted through drinking water. That simple fact indicates at once how Cholera can be prevented. Anyone, no matter how rudimentary his education may be, in possession of this fact and appreciating its significance, can easily apply it, and in that way prevent Cholera. Surely one does not want an elaborate education in physiology and anatomy to apply such a fact as that.

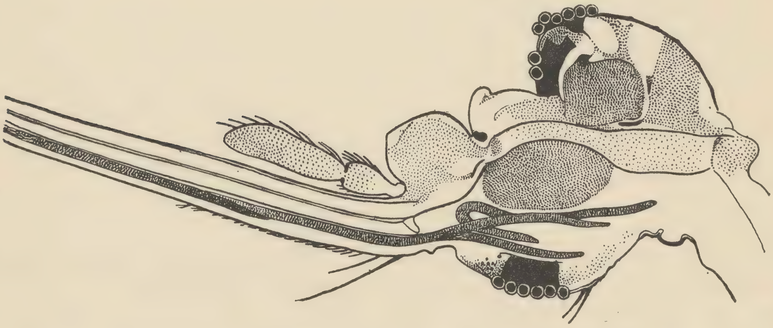
Abscess of the Liver, one of the bugbears of Tropical climates, we now know to be caused in the majority of cases by Dysentery. Prevent Dysentery in the way which I indicated before by avoiding the cause of it, and you do not get Abscess of the Liver.

I might go on to enumerate many minor diseases. I say minor diseases, although they are not minor to the individual victims of them. For example, the cause of leprosy has been found out, and from our knowledge of this cause we may yet find out the way in which it is acquired, and so learn how to avoid it.

Yaws, too, is an important skin disease of the Tropics, and has now, thanks to the labours of my friend, Dr. Castellani, who is here to-day, yielded up its secret. It depends upon an organism known as a spirochæte.

Then, again, there is the disfiguring Oriental sore which is caused by a germ, which has been demonstrated with the utmost certainty. We have much to learn about it, but that knowledge will come soon.

Elephantiasis is another disfiguring disease, which is believed to be caused by blood-worms. Guinea-worm is also a disease in Tropical countries; we now know that it is transmitted by a fresh-water flea. There is another



12. Bloodworms in Proboscis of Mosquito, Ready to Escape.

important disease which may cause anæmia and profound debility, affecting in many places 80 or 90 per cent. of the population, diminishing the labour value and also the comfort and the prospects of life in a very material way. The cause of the disease is a worm known as Ankylostomum Duodenale. It only remains to apply this knowledge to prevent the enormous amount of mischief and misery produced by this particular parasite.

13. Ankylostomum Duodenale.

I might go on in this way enumerating the various Tropical diseases and their ascertained causes for an hour instead of twenty minutes, but what I have said is sufficient, I trust, to impress upon you the fact that many of these Tropical diseases are now known—thoroughly known as regards their cause, and as to the way in which they are transmitted. One important deduction from this modern knowledge is this, that Tropical diseases are not produced, as formerly supposed, by climate. In the majority of instances, climate has nothing to do with them. Heat and moisture and so on, while they make you feel languid, and spoil your appetite and increase your thirst, do not cause disease. The causes of the chief diseases in Tropical climates are those described above, and if the causes are removed the disease will disappear. If we abolish the mosquito, or if we prevent it biting people, we will avoid malaria, yellow fever and elephantiasis. If we avoid the tick, relapsing fever will disappear. If we avoid the Tsetse fly, we will get rid of sleeping sickness. If we take care to destroy the ova of the Ankylostomum that produces anæmia, we shall abolish another disease. And so on I could go through the whole list, and show that Tropical diseases are not climatic, and are therefore avoidable. They are not a necessary consequence of climate. The disease depends upon the intermediaries through which the germ cause of the disease is transmitted, and these intermediaries are prevalent in the Tropics. Now a working knowledge of these facts can easily be acquired, and I have no doubt that the necessary information is imparted in this College.

The public—and especially those of you who send out Missionaries to work in foreign lands—should lay to heart the importance of this kind of knowledge to the Missionary. It is not fair of anyone to ask a man to go abroad and face avoidable risks; it is not fair for anyone belonging to any mission or public institution, Governmental or otherwise, to go abroad and expose himself to risks which might be avoided were he to take the trouble to put himself in possession of the necessary knowledge.

Martyrdom is one thing—suicide is another; and, although I do not like to use the word, murder is a third. To send a man abroad to work as a Missionary in unhealthy Tropical climates and not provide him with proper information as to how to prevent himself being killed—well, I do not like to characterise it. People have not yet come adequately to recognise their responsibility and duty in this matter; they will by and bye. The remedy depends upon the public. The public should demand that such a state of things should be impossible. I often, in connection with my official work, hear the Government being blamed for negligence in the matter of sanitary affairs. From my personal experience of Government officials, I know that they are all of them charitable, reasonable, intelligent, and kindly people. It is not the Government officials who are to blame; but it is you, the Public, who send your representatives to Parliament, who really are the Government of the country, who are really to blame for what it pleases people to look upon as the shortcomings of the executive Government. It is such people who are wrong—not the Government. If the people demanded such things, the officials would supply them. And, so it is, I believe, in Missionary matters. If you—the supporters of Missionary institutions—if you demanded that the men you sent out should have some instruction as to how to care for their health, and sent all such men for a preliminary training to an institution such as this, then you would be coming something near doing your duty; but until you do demand it you are not completely fulfilling your duty.

Another important matter that has often occurred to me in connection with this and similar institutions, is that which my Lord Bishop referred to when he spoke of the eagerness with which the ignorant native will swallow questionable drugs supplied by well-meaning but inadequately-trained Missionaries. I have seen many instances of this in my own experience, When I was a young fellow, I had the fortune, or misfortune, to be banished—or, rather to banish myself—to a lonely island in the Pacific, called Formosa, and there I was brought into contact with Missionaries—some excellent men. One in particular I recollect, who, observing in the hospital the effect of iron in relieving certain cases of anæmia, used to go about the country in a large-hearted, liberal sort of way, and, as he said, *pour* iron into the anæmic native! In many instances he may have done good, but I venture to say that from ignorance in diagnosis, and from over-confidence in iron and in his own skill, he did more harm in the aggregate than good. The man who prescribes drugs ought to know—as students here are taught to know—that drugs are potent for evil as well as for good. They ought to know the effect of the drugs of which they are in possession, and to eschew giving drugs in those cases of disease of which they know nothing.

I think an education in physiology and anatomy is an admirable training for the man going out to preach the Gospel. A man is not complete if he knows only the spiritual side; he requires to supplement that by a knowledge of the body in which the spirit is encased. Given this knowledge he is a better teacher in every way. Moreover, he is in a better position to do all-round good to those to whom he preaches. He can supply a better education to the natives in place of much that is now taught, which is of no practical value. For instance, if you teach him when a child that the mosquito that bites him may convey to him the germ of a disease, you will teach him something that will be of use to him. Train up a child in the way he should walk, and when he is grown he will not only benefit personally, but he will assist, at all events, in propagating the doctrines of hygiene, which the European teacher is anxious for him to adopt. My idea is that the native should receive, as part of his regular education in the Missionary schools, some teaching in elementary hygiene.

LIVINGSTONE COLLEGE.

AIMS AND OBJECTS.

The Course of Training at Livingstone College has been devised for the purpose of giving men who are, or who intend to be, Foreign Missionaries, an elementary knowledge of medicine and surgery.

It is intended to teach Missionaries—

(*a*) How to care for their own health and the health of their fellow-missionaries when far from qualified medical aid.

(*b*) How to deal with the more simple diseases of the natives of the country in which they will be working.

It is not intended to train men as "medical missionaries" (a term which is only properly applied to men and women possessing a medical qualification), and those who enter are required to sign a declaration that they will not take to themselves this title, or otherwise assume the position of a qualified doctor.

PERIOD OF STUDY.

The regular session at Livingstone College extends over nine months, the first term being devoted chiefly to the study of Anatomy and Physiology, the second term to the Elements of Medicine and Surgery, and the third term chiefly to a careful course of Lectures on Tropical Diseases, together with other special subjects. Practical work is obtained at various Hospitals, and Tropical Diseases can be seen by kind permission of the authorities at the Seamen's Branch Hospital, Connaught Road. Students who are unable to enter for the full nine months may enter for periods of six months or three months.

SHORT COURSE OF LECTURES ON TROPICAL HYGIENE.

A Short Course of Lectures on Tropical Hygiene is given at least twice a year, which can be attended by students who are not able to attend the lectures in the third term. This course is also arranged in order to meet the convenience of students who are unable to attend any of the longer courses, but who are anxious to obtain some knowledge of the nature of Tropical Diseases and their prevention before going abroad. The following subjects are usually dealt with during these lectures, which are held during one week usually in the months of March and December, and they are open to men and women, the longer courses being open to men only :—

Clothing in the Tropics.
Food in the Tropics.
Water in the Tropics.
Sanitation in the Tropics.
The Malarial Parasite.
Prophylaxis of Malaria.
Symptoms and Treatment of Malaria.
Blackwater Fever.
Tropical Parasites.
Enteric Fever, Dysentery, Cholera, Sprue, Prickly Heat, and Jiggers.
Medicines and Medicine Chests in the Tropics.
Cookery.

Full particulars may be obtained on application to the Principal, Livingstone College, Leyton, E., who will gratefully acknowledge contributions to the funds of Livingstone College.